# NSF Division of Astronomical Sciences (AST) Town Hall

January 5, 2015

*Jim Ulvestad, Division Director, MPS/AST*

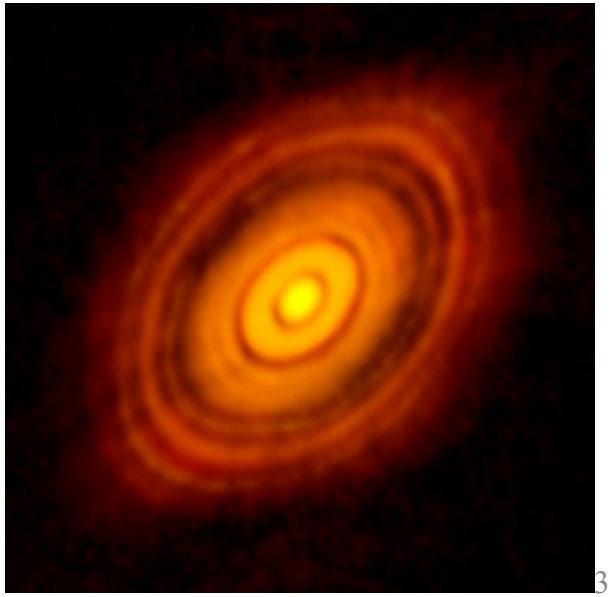
*Patricia Knezek, Deputy Division Director, MPS/AST*

# Outline

- Highlights
- Staffing
- Individual Investigator Program
- AST Career Opportunities
- Decadal Survey, Portfolio Review, NRC
- Budget Primer and Status
- Town Halls and Other Sessions

# ALMA Construction Nearly Completed

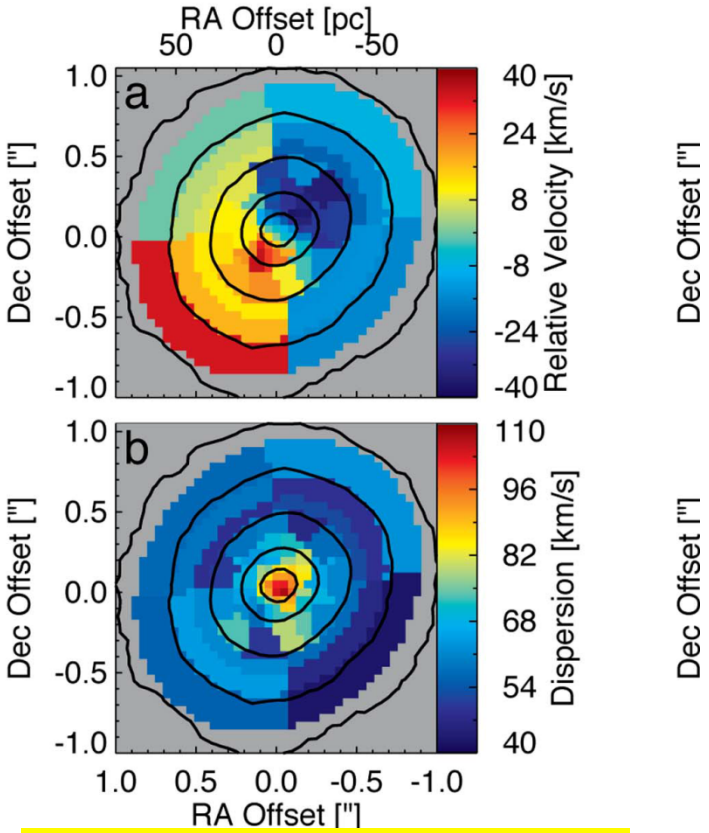
- Top-level science objectives:
  - Image the redshifted dust-continuum emission from evolving galaxies as early as 500Myr after the Big Bang (z~10).
  - Determine the chemical composition and dynamics of star-forming gas in normal galaxies like the Milky Way but ¾ of the way across the Universe (z~3).
  - Measure the gas kinematics in young disks in nearby molecular clouds and detect the tidal gaps induced by planet formation.



See Plenary 416.01

# Massive Black Hole in M60-UCD1

- Ultra-Compact Dwarf Galaxy M60-UCD1 observed with Gemini-N AO system, imaged with HST
- Spectroscopy shows clear rotation in inner arc-second and high velocity dispersion in inner 0.1 arc-sec
- Interpreted as black hole of 20 x $10^6$ $M_{Sun}$ in galaxy of total mass only 140 x $10^6$ $M_{Sun}$




Credit: University of Utah/Nature

- Seth et al., 2014, Nature, 513, 398

# Pleiades Distance

- Hipparcos “accepted” distance to Pleiades is 120.2 +/- 1.5 pc closer than previously accepted distances that were >10% larger
- VLBI parallax measurements of 5 stars in Pleiades give distance of 136.2 +/- 1.2 pc, consistent with pre-Hipparcos results
- Implications for astrophysical models of Pleiades-age stars

Credit: NOAO/AURA/NSF

- Melis et al. 2014, Science 345, 1029

See Paper 230.06

# Major Construction Projects



# More Highlights

- Daniel K. Inouye Solar Telescope (DKIST) construction well under way
- Construction award made for Large Synoptic Survey Telescope (LSST)
- Mid-Scale Innovations Program (MSIP) concluded its first round, with new awards
- Completed reorganization of grant discipline areas to group Planetary and Exoplanetary Astronomy

# Management Competitions

- National Science Board policy states that periodic competitions of managing organizations for national facilities are important for providing fresh ideas and acquiring the most efficient delivery of science for the taxpayer dollars invested
  - NOAO competition reaching its conclusion, new cooperative agreement to begin October 2015
  - NRAO proposal deadline in November 2014
    - New cooperative agreement, October 2016
  - Gemini proposal deadline in February 2015
    - New cooperative agreement, October 2016

# Key AST Events Since June 2014

- July/August: NRAO management competition site visits, proposals received November 2014
- August: First MSIP awards made
- August: LSST construction award made
- October: Gemini management competition site visits, proposals due February 2015
- November: Arecibo mid-term management review
- November: AAG Program received 770 proposals
- December: AST Committee of Visitors
- December: Congress passed the FY 2015 budget

# Division of Astronomical Sciences (AST)

## Office of the Division Director

*James Ulvestad*
Division Director

*Patricia Knezek*
Deputy Division Director

*Elizabeth Pentecost*
Project Administrator

*Donna O'Malley*
Operations Specialist

*Vernon Pankonin*
Senior Advisor

*Craig McClure*
Program Support Manager

## Administration

*Diana Phan*
Program Analyst

*Matthew Viau*
Program Assistant

*Ashley Dunlap*
Administrative Support Assistant

## Individual Investigator Programs and Astronomy & Astrophysics Research Grants

*Daniel Evans*
Education & Special Programs (CAREER, REU, PAARE)

*Eric Bloemhof*
Advanced Technologies & Instrumentation

*Joan Schmelz*
Astronomy & Astrophysics Postdoctoral Fellowship

*Richard Barvainis*
Extragalactic Astronomy & Cosmology

*Glen Langston*
Galactic Astronomy

*Maria Womack*
Planetary Astronomy

*James Neff*
Stellar Astronomy & Astrophysics

*David Boboltz*
Theoretical and Computational Astrophysics Networks

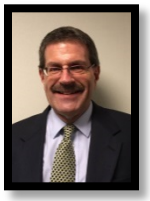
*Eric Bloemhof*
Major Research Instrumentation

*Sandra Cruz-Pol*
Enhancing Access to the Radio Spectrum

## Facilities, Mid-Scale & Future MREFC Projects

*Philip Puxley*
Atacama Large Millimeter Array

*Dana Lehr*
National Radio Astronomy Observatory



*Ralph Gaume*
Arecibo Observatory

*Gary Schmidt*
Gemini Observatory

*Nigel Sharp*
Large Synoptic Survey Telescope

*Craig Foltz*
Daniel K. Inouye Solar Telescope

*Vernon Pankonin*
National Optical Astronomy Observatory

*Vernon Pankonin*
Giant Segmented Mirror Telescope

*Richard Barvainis*
Mid-Scale Innovations Projects

*Richard Barvainis*
University Radio Observatories

*David Boboltz*
National Solar Observatory

## ESM

*Mangala Sharma*
Electromagnetic Spectrum Management

*Sandra Cruz-Pol*
Electromagnetic Spectrum Management

# AST Scientific Staff Changes Since Jan. 2014


- Craig Foltz: Program Officer, retiring in Jan. 2015
  - Dave Boboltz: Program Officer for NSO, now also DKIST Program Manager




- Andy Clegg: Program Officer, spectrum management and EARS, left in January 2014; Glen Langston: Program Officer, Feb. 2013, transitioning from spectrum management to grants programs and EPO
- Mangala Sharma and Sandra Cruz-Pol, Program Officers, spectrum management and EARS, August 2014

- Ilana Harrus: Program Officer, left in May, 2014

# AST Scientific Staff Changes Since Jan. 2014

- Ralph Gaume: Program Officer for Arecibo Observatory, October 2014

- Gary Schmidt: Program Officer for Gemini Observatory, Major Research Instrumentation, retiring in March, 2015. Job ad is out.

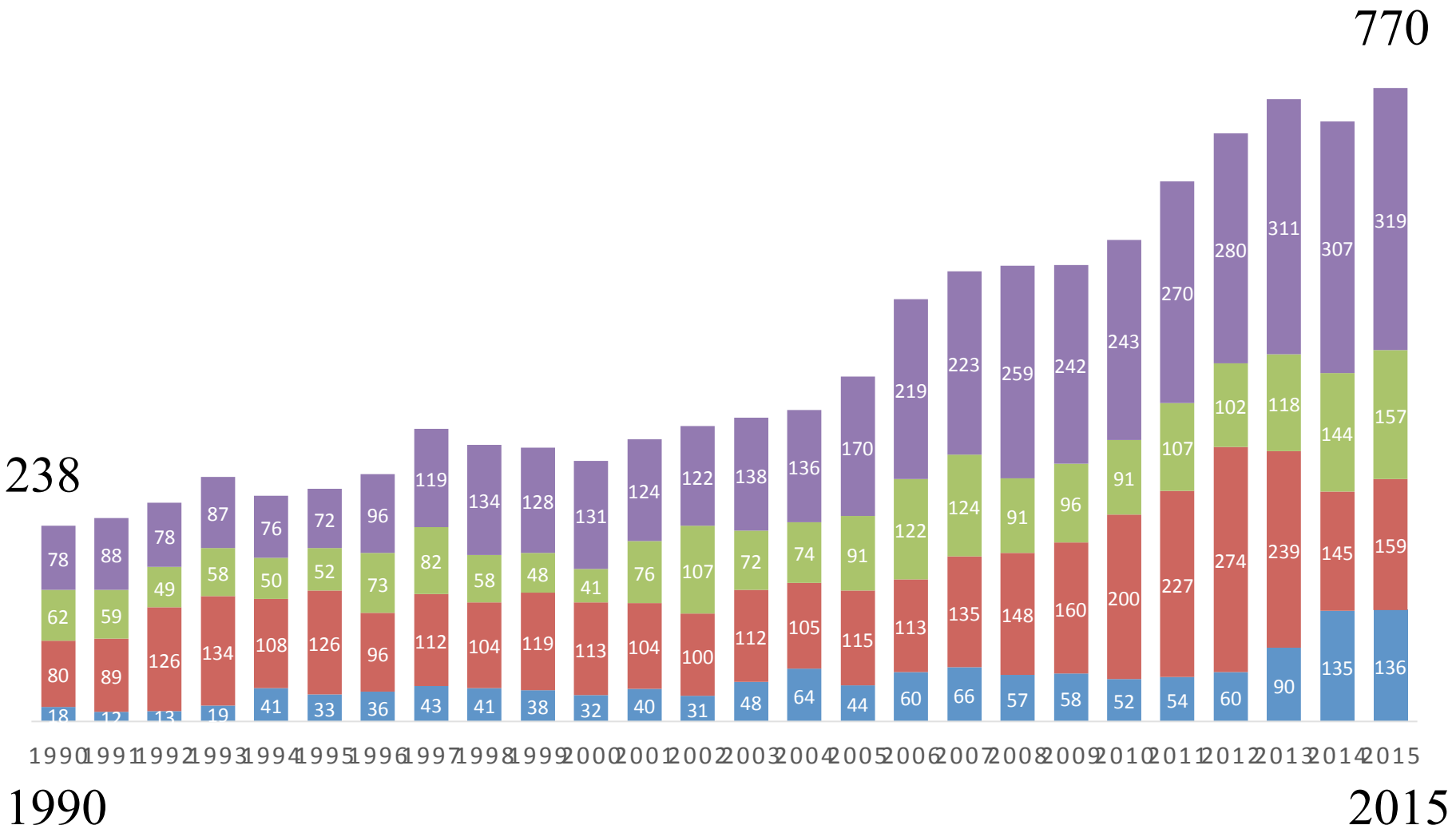
- Ed Ajhar concluded rotator term at end of January 2014, Dan Evans took over as Individual Investigator Program lead.

- Maria Womack concludes her rotator term in January, 2015. Search underway for replacement.

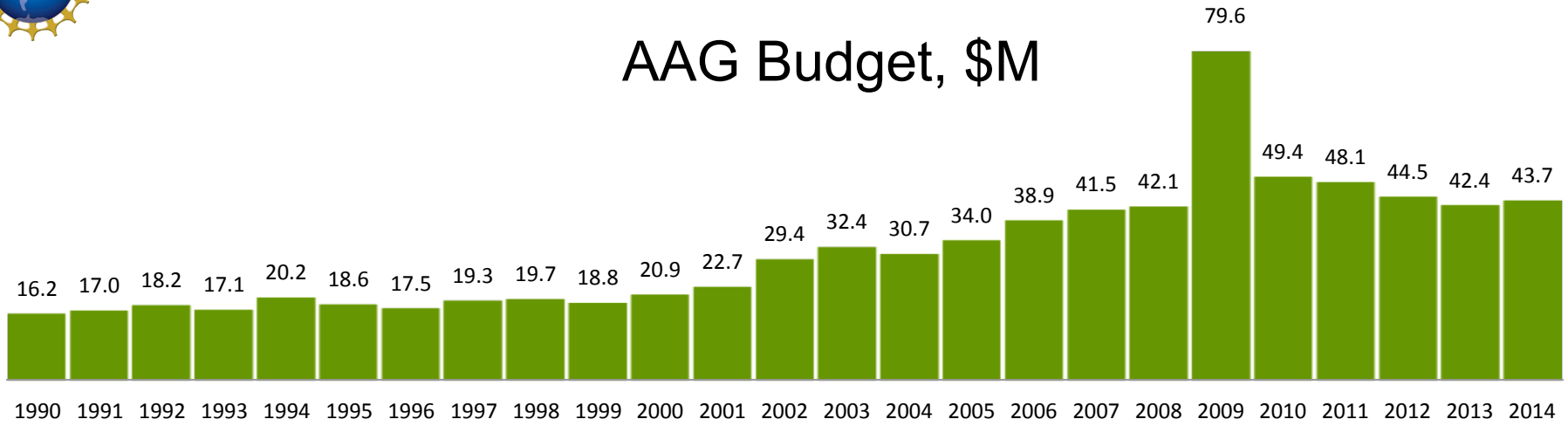
# Unrestricted Grants (AAG)

- Success rate in FY 2014 bounced slightly up to 16% because of our and your efforts!
  - Under consideration: reducing frequency of AAG calls, restricting numbers of proposals per investigator/ institution
  - Strongly encouraged investigators to restrict themselves to 1 AAG proposal in FY 2015
  - AST needs to develop strategy for what to do when funding rates hit 12%, 10%, 8%
- Actions in FY 2014
  - More automated compliance checking; use of admin staff
  - Removed some criteria for return without review
  - Called on facility program officers to help run panels

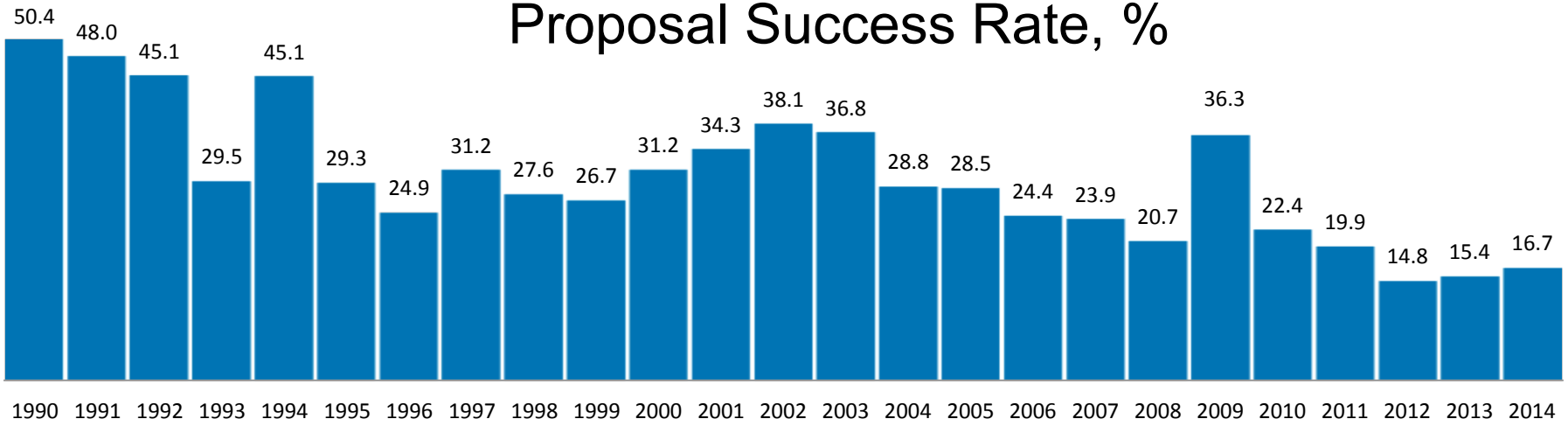
# # Proposals in AAG



# AAG Budget, $M




# Proposal Success Rate, %



# Types of AST Positions

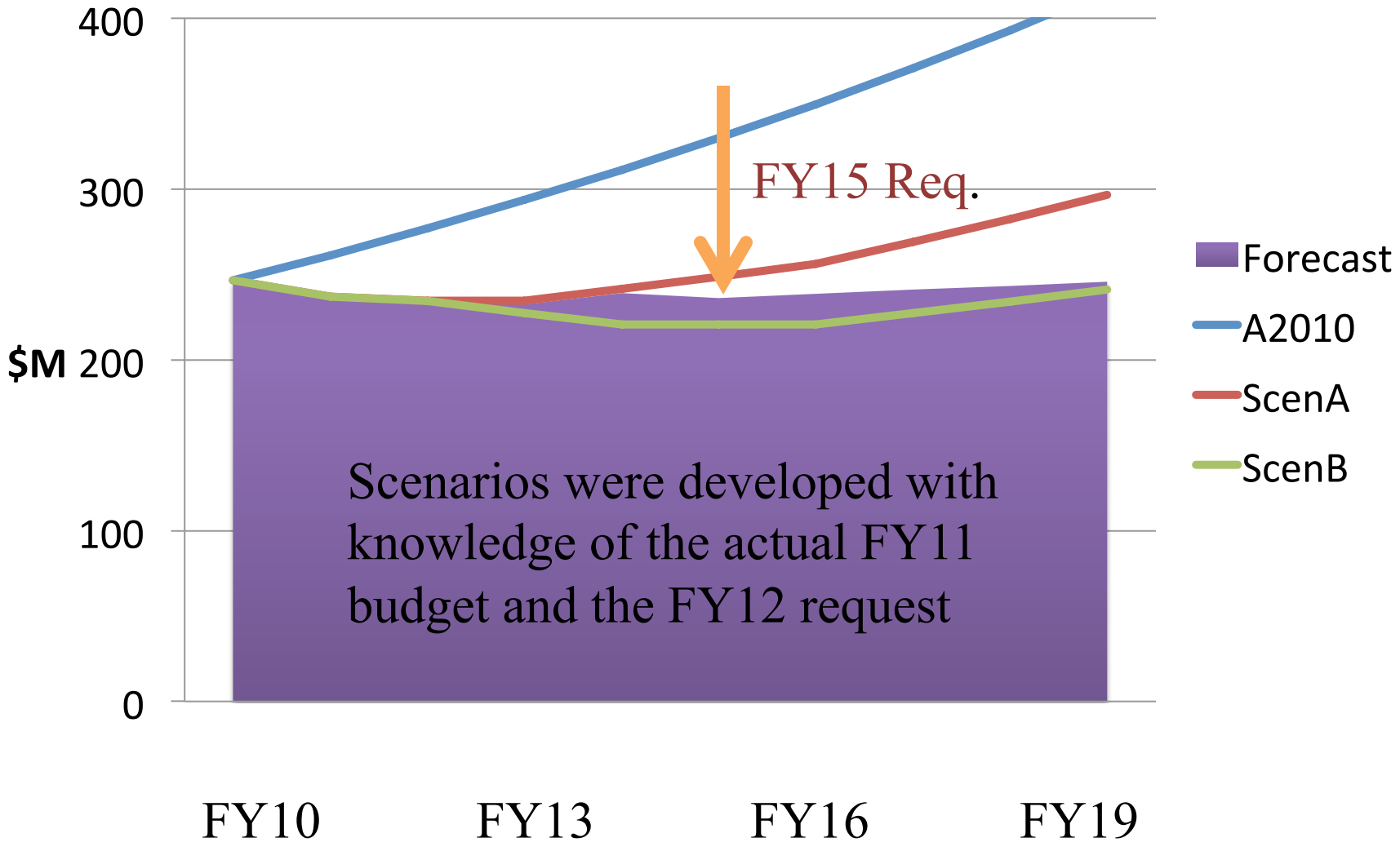
- Program Officer/Director
  - Permanent Federal Employee
    - Must be a U.S. citizen or seeking citizenship
  - Rotators
    - Intergovernmental Personnel Act (IPA)- remain an employee of home institution
      - 1 – 3 years (in rare cases, 4 years)
    - Visiting Scientist, Engineer, and Educator (VSEE) Program (VSEE)
      - 1 -2 years
      - Must be a U.S. Citizen or able to demonstrate seeking citizenship
  - Temporary Federal Employee (FedTemp)
  - Expert – usually short term, few months to 1 yr
  - AAAS Policy Fellow
  - Science Assistant – usually BA or MA level

# Career Opportunities

- AST expects several openings for permanent positions over next few years because of retirements
  - Emphasis on facility oversight in some cases, e.g. Gemini Observatory right now
- Current IPA rotator opening, with emphasis on planetary/exoplanetary or stellar astronomy
  - Opportunity to participate in defining and implementing joint NSF-NASA program in exoplanetary science

# Decadal Survey, Portfolio Review, NRC

# *NWNH* Budget vs. Actual Budget



# *NWNH* "Large" Ground Projects

- Large Synoptic Survey Telescope (LSST)
  - Construction award in August 2014; "first stone" in April
  - Spun up NRC committee to study OIR system in LSST era
- Mid-Scale Innovations Program (MSIP)
  - FY13 solicitation; categories modified from *NWNH*

| Awarded Proposal | PI | Amount | Funded |
|---|---|---|---|
| Zwicky Transient Facility | Kulkarni | $9.0M | FY 2014 |
| Advanced ACTPol | Staggs | $10.0M | FY 2014 |
| H Epoch of Reionization Array | Parsons | $2.1M | FY 2014 |
| Two More Proposals | Various | $9.0M | FY 2015 Rcm |
| One More Proposal | Pending | Co-fund, $5.0M | Pending |

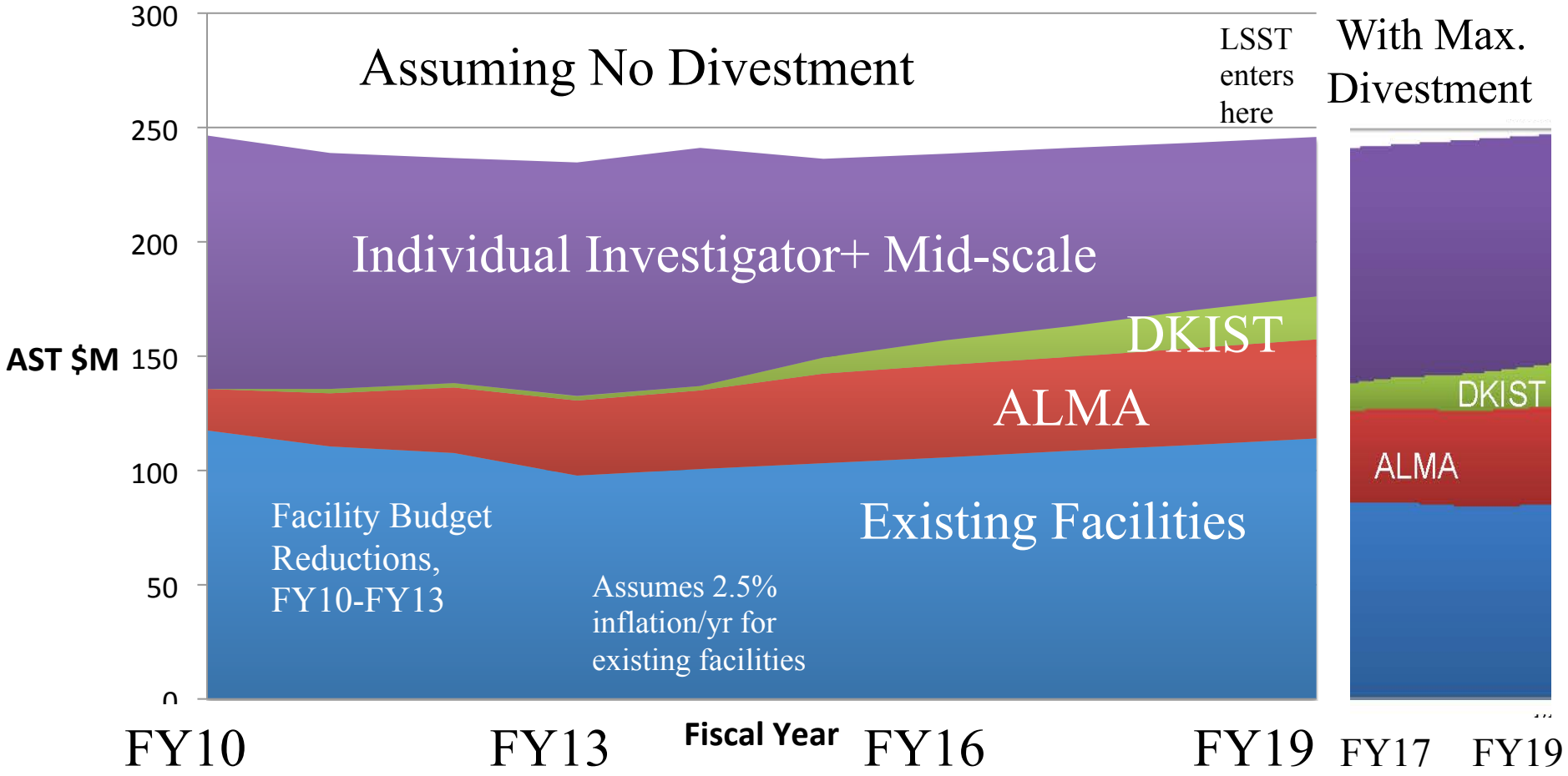
# NRC/CAA OIR System Study

- "A Strategy to Optimize the U.S. Optical and Infrared System in the Era of the Large Synoptic Survey Telescope (LSST)"
- Committee chaired by Debra Elmegreen, Vassar College
- Three face-to-face meetings
  - July 31/August 1; October 12-13; December 2-3
- Community input solicited
- October meeting had presentations from observatory directors, GMT, TMT, adaptive optics experts, ESO, etc.
- NSF has noted importance of recommendations in areas of instrumentation and data management, plus the people/training needs to support these areas
- Report expected in Spring 2015

# Next "Senior Review"

- *NWNH*, p. 32:
  - "NSF-Astronomy should complete its next senior review before the mid-decade independent review that is recommended elsewhere in this report, so as to determine which, if any, facilities NSF-AST should cease to support in order to release funds for (1) the construction and ongoing operation of new telescopes and instruments and (2) the science analysis needed to capitalize on the results from existing and future facilities."
- This became the AST Portfolio Review (PR)

# AST Portfolio Scenarios




AST budget assumption: FY15=Request, 1%/yr growth thereafter

# Generic Divestment Response Process

- Pursuing partnerships with universities, institutes, and federal agencies through meetings & negotiations
- In 2014, NSF (Office of General Counsel) hired an engineering firm for all NSF environmental contract work
  - Undertaking engineering feasibility and baseline environmental review to identify feasible alternatives for facilities
  - Will be followed (2015-2016) by formal environmental review processes, leading to preferred alternatives for facilities that do not have viable partnerships in view

# Facility Futures

| Telescope | Status |
|---|---|
| KPNO 2.1m | Open ops ended; proposals for new operator under evaluation |
| Mayall 4m | Slated for DESI, pending DOE funding; bridge from NSF |
| WIYN 3.5m | NOAO share to NSF-NASA Exoplanet Research Program |
| GBT | Partner discussions in progress; engineering study under way |
| VLBA | Partner discussions in progress; engineering study under way |
| McMath-Pierce | Bridging to university-led consortium; engineering study |
| GONG/SOLIS | SOLIS moved off Kitt Peak; GONG partner discussions in progress |
| Dunn Solar Tel. | Partner discussions in progress; engineering study under way |
| Arecibo | Post-2016 status in discussion; engineering study under way |
| SOAR | Post-2018 status to be reviewed |

# NASA/NSF Partnership for Exoplanet Research

- New Worlds, New Horizons:

  "*NASA and NSF should support an aggressive program of ground-based high-precision radial velocity surveys of nearby stars to identify potential candidates … for a future space imaging and spectroscopy mission*".

- NASA/NSF Partnership using NOAO share of WIYN telescope

  –Enable a community based exoplanet research program in support of NSF research interests and NASA mission goals (e.g., Kepler, K2, TESS, JWST, WFIRST, etc.).

  –Provide US astronomical community with open access to a world-class precision radial velocity facility instrument

- Anticipated timeline:

  –2015-2018 – Exoplanet-targeted Guest Observer program with existing instrumentation on WIYN using NOAO share of WIYN time

  –2015-2018 – NASA funded development of facility-class Extreme Precision Doppler Spectrometer (EPDS) for the WIYN telescope

    - January 2015 – EPDS solicitation as amendment to ROSES 2014 NRA
    - August 2015 – announcement of selection, initiation of project
    - 2017/2018 – commissioning of EPDS and beginning of operations

  –2018-TBD – Exoplanet-targeted Guest Observer and guaranteed time program at WIYN with EPDS instrument and existing WIYN instruments

# Budget Primer and Status

# President's Budget Request—A Primer

OMB sets NSF budget level, includes initiatives

NSF holds out funds for initiatives, distributes rest to Directorates

Directorates divide among Divisions, using fancy algorithms based on past spending, play in new initiatives, etc.

- Strong constraints on how Divisions can allocate funds

AST discusses priorities throughout year, focusing on NRC and Advisory Committee recommendations

Responsible stewardship of national facilities

Some allocations directed to priorities such as mid-scale

For flat budgets, flexibility is at the margins

# What Can Happen

- Congressional appropriation similar to President's Request (e.g., FY 2010, FY 2015)
  - NSF will execute program similar to Request
- Congressional appropriation well below President's Request (e.g., FY 2011-FY 2014)
  - Some initiatives/programs go away or are cut significantly, while others are protected
  - Most programs reduced relative to Pres. Request
- Example, MPS in FY 2013 sequestration year
  - Interdisciplinary initiatives protected: CHE, DMR
  - Facilities protected: AST
  - Consequence: PHY and DMS took very heavy cuts

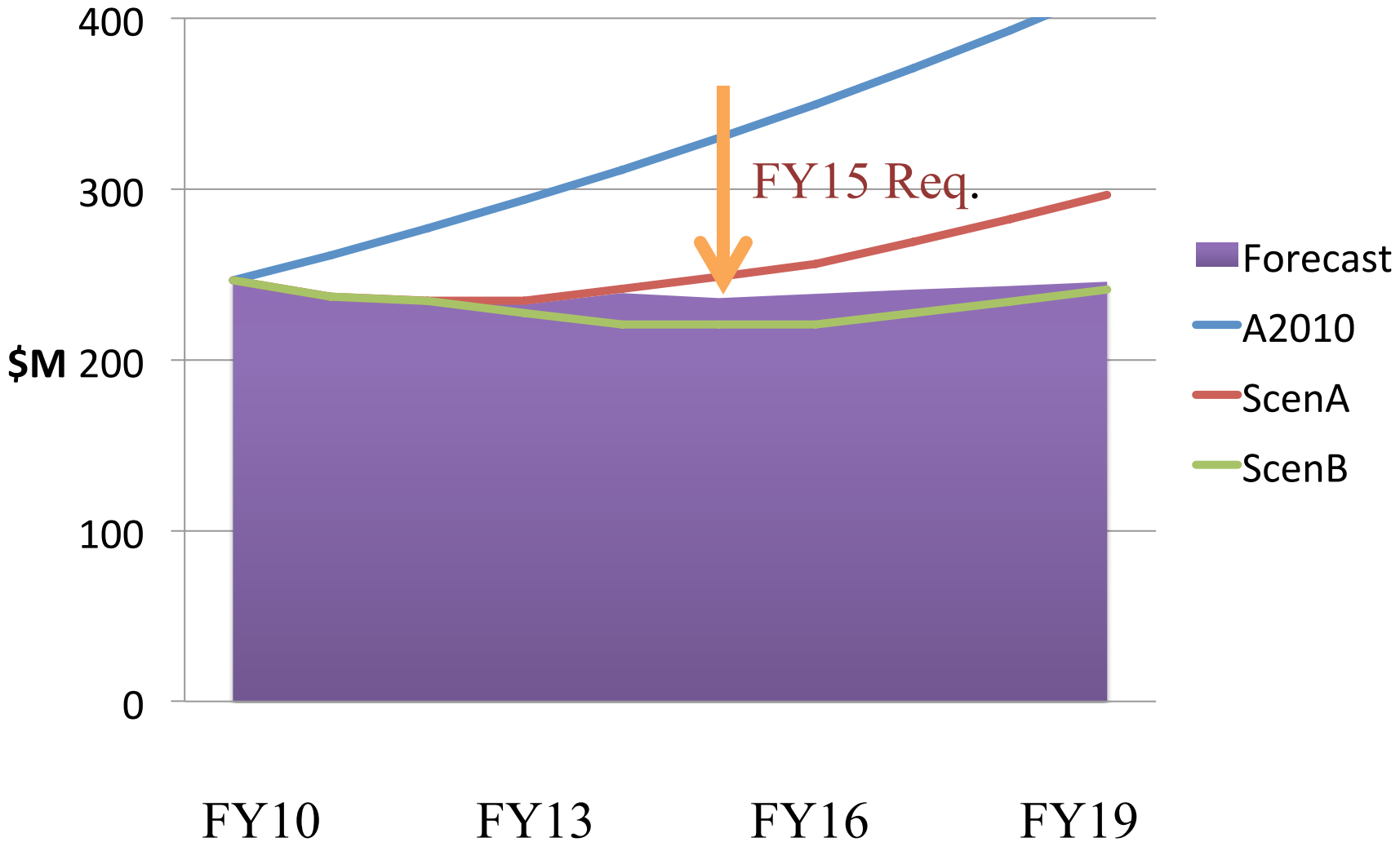
# Congressional Appropriations

- Congress received request for FY 2015 in Feb. 2014
- Congressional committees met over summer, reported out bills for various subsets of government
  - Included language mandating spending levels on some favorite or unfavorite programs
- "Cromnibus" appropriation passed in mid-December
  - Note: AST is not a "line" item in budget, included in "Research & Related Activities" line item
  - NSF has 45 days to submit Plan to Congress
    - Committee language mandatory if not superseded
  - Congress has 30+ days to approve or not
    - Hence, no "Approved" public plan until March 2015
    - This has been as late as May/June in recent years

# Expectations for AST in FY 2015

| | FY14 Req | FY14 App | App/Req | FY15 Req | FY15 App | App/Req |
|---|---|---|---|---|---|---|
| NSF Total | 7626 | 7172 | 0.940 | 7255 | 7344 | 1.012 |
| NSF R&RA | 6212 | 5809 | 0.935 | 5808 | 5934 | 1.022 |
| MPS | 1386 | 1300 | 0.938 | 1296 | ??? | ??? |
| AST | 244 | 239 | 0.980 | 236 | ??? | ??? |

# *NWNH* Budget vs. Actual Budget



# Town Halls and Other Sessions

- AAPF Symposium; Saturday/Sunday
- Next-Generation VLA; Sunday
- TMT Open House, Mon., 5:30, 6B
- 209: NSF ADVANCE program; Tues., 10:00, 606
- 218: Town Hall: Transforming NOAO, Tues., 12:45, 6A
- New Capabilities at NRAO, Tues., 1:30, 303
- 237: NRAO Town Hall; Tues., 6:30, 4C
- Gemini Open House; Tues., 6:30, 6A
- 325: Public Policy: Agency Rotators; Wed., 2:00, 606
- NOAO Data Reduction Wkshop, Near-IR; Wed., 2:30, 401
- 335: Town Hall: Astro Science Policy Wed., 6:30, 606
- 416: ALMA View of Universe, Plenary; Thurs., 11:30, 6E